

Summary Information

Module Code	4301MECH
Formal Module Title	Engineering Mathematics 1a
Owning School	Engineering
Career	Undergraduate
Credits	10
Academic level	FHEQ Level 4
Grading Schema	40

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Amir Asghari	Yes	N/A

Module Team Member

Contact Name	Applies to all offerings	Offerings
Margaret Toft	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings
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Teaching Responsibility

LJMU Schools involved in Delivery
Computer Science and Mathematics
Engineering

Learning Methods

Learning Method Type	Hours
Lecture	11
Tutorial	11

Module Offering(s)

Offering Code	Location	Start Month	Duration
SEP-CTY	CTY	September	12 Weeks

Aims and Outcomes

Aims	To provide a foundation in engineering mathematics for its application to the solution of engineering problems.
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Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Use basic numeric and algebraic manipulations in the solution of engineering problems.
MLO2	Use basic mathematical functions including trigonometric, exponential and logarithmic functions in the solution of engineering.
MLO3	Use basic complex numbers in the solution of engineering problems.
MLO4	Use and apply mathematical software to the solution of engineering mathematics problems.

Module Content

Outline Syllabus
Introduction of the use of a computer algebra system (for example MATLAB or similar). Use of the software applied to the syllabus items below. Revision of basic algebraic techniques: Substitution, simplification, factorisation, indices, evaluation and transposition of formulae, fractions and partial fractions. Linear and quadratic equations, linear simultaneous equations. Functions: Notation, types of function, composite and inverse, graphs. Trigonometry: Angles and circular measure. Trigonometric ratios for right-angled triangles. Sine and cosine rules. Trigonometric functions and their graphs, simple trigonometric identities and equations. Engineering waves in mechanical and electrical problems. Exponential function: Properties and graph. Natural logarithm as inverse of exponential function, graph and properties. Definitions and calculation of hyperbolic functions including inverse functions. Complex numbers: Complex arithmetic, complex conjugate, Argand diagram. Rectangular, polar forms. Magnitude and phase. Very basic treatment of Euler's formula.

Module Overview

Additional Information

This module provides a foundation in pre-calculus for level 4 students in mechanical and electrical engineering to enable them to apply this to the solution of engineering problems.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Learning Outcome Mapping
Test	VLE Based Tests	100	0	MLO2, MLO1, MLO4, MLO3